Journal of the Philosophy of Sport, 2009, 36, 152-161

The Ethics of Performance-Enhancing Technology in Sport[1]

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Debates on sport technologies tend to engage. Sometimes they have a unifying effect. As is evident from the 1999 establishment of the World Antidoping Agency (WADA), there is a relatively strong consensus that the use of performance-enhancing drugs, or doping, should be banned in sport. Sometimes technology causes controversies. New movement techniques, such as the so-called flop in height jumping developed by Dick Fosbury in the mid 1960s, or the V-style in ski jumping introduced by Jan Bokløv in the late 1980s, led to heated debate on the aesthetics and meaning of the sports in question. Innovative equipment such as body suits in swimming designed to reduce water friction, or shorter alpine skis with radically improved carving capabilities, are sometimes considered to challenge traditional athletic skills. Critics argue that these new means "technologize" sport. In the most serious cases, such as with potentially performance-enhancing genetic technologies, new means are seen to threaten the very idea of athletic performance as we know it (15,19).

In this essay I attempt to deal with value questions linked to sport technology in a philosophically informed way.[2] More specifically, I will present a normative framework within which to reason systematically about where to draw the line between valuable, acceptable, and nonacceptable technologies in sport. First, sport technology is defined and a tentative categorization of sport technologies is proposed. Secondly, three ideal-typical normative views and their implications for technology are discussed. I conclude by pointing at one particular normative view as the more promising one in this respect.

Sport Technology and Its Functions

The concept of technology is ambiguous and has been analyzed from various perspectives. Idhe (11) is concerned with the nature of technology or the phenomenon of technology 'in itself', so to speak. Ellul (6: xxv) speaks of technology in a wide, almost all-expanding Heideggerian manner as ". . . the totality of methods rationally arrived at and having absolute efficiency for a given stage of development in every field of human activity". A more narrow approach corresponds to a larger extent to ordinary use of the term. Dictionary definitions see 'technology' as ". . . material objects of use to humanity, such as machines, hardware or uten-

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sils", or ". . . broader themes, including systems, methods of organization, and techniques".[3] Tiles and Oberdieck (31: 5) popularize and specify this common sense understanding when they talk of ". . . material devices designed and manufactured to make existing human activities easier or to make possible activities which people have dreamt of engaging in but to which they are not biologically adapted".

In line with this, I shall understand technology as human-made means to reach human interests and goals. Sport technology, then, are human-made means to reach human interests and goals in or related to sport. What are these goals?

As with "technology", "sport" can be understood in a wide and a narrow sense. In the wide sense, sport refers to everything from Olympic elite sport to aerobics and outdoor recreation. Sport is viewed more generally as movement culture. In the more narrow sense, sport refers to training and preparation for and participation in competitions in which physical abilities and skills are decisive for the outcome (18). In terms of social organization, the structural goal of sport competitions is to measure, compare and rank participants according to athletic performance (15). In this essay, I concentrate on sport in the narrow sense as this is where the most critical issues over technology seem to arise.

What then are the functions of technology in sport? An obvious function is the constitutive one. Technology is a necessary condition for many sports to arise at all.

Skiing became possible approximately 4500 years ago as Scandinavians developed the first wooden remedies to slide on snow. Cycling sports arise with the technological development of the bike in the 1860s. Parachute jumping, with a history dating back to the late 1700s, became a sport in the early 1950s with the development and spread of aviation.

Secondly, technology can be designed to prevent injury and protect against harm. With an increased social and cultural emphasis on promotion of health and prevention of injury and illness (33), this goal has become particularly significant in the last decades. Examples can be the development of improved shock-absorbing soles in running shoes, nonvibration material in tennis rackets, the release binding in alpine skiing, or the variety of protection gear and helmets for a series of sporting activities.

Thirdly, technology serves as performance-enhancing means. In part, new material and design of swim suits, or tennis rackets, or alpine skis are used to make performance more efficient and precise. Also technology used outside of competitions such as training machines, hypoxic tents and chambers, or biochemic means and methods are developed or at least applied with clear performance-enhancing intentions.

Usually, one and the same technology serves several functions. Improved design of alpine skis can enhance performance but can also make skiing easier and safer. Training machines can stabilize movements and make strength training more efficient and less risky.

The constitutive functions of technology are rather uncontroversial. There is also considerable positive interest in sport technology that reduces the risk for harm and injury. In terms of value tensions, the hard cases are those linked to performance-enhancement. The doping issue can be the paradigmatic example. According the World Antidoping Code (WADA), doping contradicts the very

"spirit of sport." [4] In what follows, I will focus on technologies used to enhance performance.

Performance-Enhancing Technologies: Kinds and Challenges

A primary and original performance-enhancing technology is the strategic use of body movements as a means to reach sport-specific goals; *body techniques*. Phenomenologists examine the body as subject and concentrate on experiential qualities or the "lived experience" of performance (32). Biomechanists analyze the body as a system of forces in interaction with systems of external forces of the environment. The perspective is an outside, objective point of view (5). From both perspectives, however, body techniques can be seen as technology or as means with which athletes search to realize sport-specific goals.

Sometimes, innovations in body techniques cause value conflict. At the time of introduction new techniques in height and ski jumping had their opponents. Usually however opposition comes from a conservative and puristic minority. Provided they do not imply obvious risks for harm, new movement techniques are considered the admirable results of trial-and error- processes among talented athletes and coaches. In the histories of their sports, height jumper Dick Fosbury and ski jumper Jan Boklöv are considered creative innovators who made a difference.

The interpretation of body techniques as technology might go against common interpretations of the term. The more obvious association is probably that of the material means with which athletes perform, or what is commonly referred to as *sport equipment:* skis, bikes, tennis rackets, soccer shoes. Equipment does not only have constitutive roles but is crucial in performance. To the good tennis player, the racket becomes a prolongation of the arm with which she feels and interacts with the environment. In magic moments in bicycling, rider and cycle tend to become one unified, balanced whole.

Perhaps more often than with body techniques, innovations in sport equipment causes controversies. To a certain extent, discussions arise of the role of technology in skill development. New and more efficient golf clubs have been met with skepticism and arguments about "de-skilling" of the sport. Even more often, issues of fairness arise. If technological innovation is limited to a few, there will be an unfair inequality in competition. In skiing, inequalities in ski sole quality and preparation may have decisive impact on the outcome. In cycling, development of new and more aerodynamic bikes may cause gross inequalities if they are not accessible to all.

A third category of performance-enhancing technology includes all kinds of human-made means used outside of competition in training and preparation. One typical feature of modern sport is the immense growth of what can be called *training technology:* weights and strength training machines, tread mills for running, wind tunnels for finding aerodynamic positions in speed sports, et cetera.

Again, athletes, coaches and technologists demonstrate creativity. But again, controversies may arise. Some decades ago, the introduction of weight training met opposition as it contradicted what was considered a normal physical development. In cross-country skiing, for example, such training seemed to threaten the

ideal of 'the natural' (1). With today's increased impact of science and systematic training, most training technologies are considered valuable and acceptable, at least as long as they do not represent unreasonable risks of injury and harm.

A final kind of out-of-competition technology is the variety of biomedical technologies ranging from advanced nutritional regimes via technologically created hypoxic environments to drugs and in the future perhaps genetic technology. These means differ from training technology as they are designed to enhance performance without really requiring athlete effort and control. Their efficiency depends upon the assistance of external experts. Hence, they can be called *expert-administrated technologies.* Some of these technologies are extremely powerful, and it is primarily here we find the most radical ethical challenges of technology to sport.

How are we to respond to the challenges of the various performance-enhancing technologies? Is it possible to distinguish on reasonable grounds between valuable, acceptable and nonacceptable means? How can performance-enhancing technologies be examined from a critical, normative point of view?

Three Ideal-Typical Theories of Sport

I have understood technology as human made means to reach human interests and goals. Obviously, then, one and the same technology can take on different status in different human practices. A main goal of medicine—to cure illness and promote health—can in many instances justify the use of synthetically produced erythropoietin such as EPO. According to the Prohibited List of the World Anti-doping Agency (WADA), the goals of sport do not.

The structural goal of sport competitions is that of measuring, comparing, and ranking participants according to athletic performance. But structural goals define the organization of a social practice and say little of its meaning and value. Neither do they provide any clarification of what kinds of technology should be allowed, and what kinds should be banned. Informed responses to questions on performance-enhancing means necessarily need to build on normative ideas of what sporting competitions and athletic performances are all about.

An athletic performance is an immensely complex product of a large number of genetic and environmental factors from the moment of conception to the moment of performance. The process starts with the very first biological interaction between a child and the mother; continues with basic nourishment and care during infancy; general sociopsychological and sociocultural influences; sport-specific influences in the form of training and access to facilities, equipment and expertise; and ends with the immediate and concrete context of the performance. Some of these factors are based on chance such as the genetic predispositions defined by 'the natural lottery'; some factors are based on luck (good or bad), for instance in terms of a sport-friendly or a nonsporting environment in which one grows up, or the in-competition occurrence or the lack of a sudden wind that carries the javelin another half meter; and parts are based on merit in terms of athletes' hard work to develop their talent (15). What factors should be included in evaluations of athletic performance, and what factors, if any, should be eliminated or compensated for? In what follows, I shall examine three ideal-typical theories in this respect.

I use the term 'ideal-typical' in a Weberian sense. Ideal-typical theories are not empirically grounded descriptions of sport views but consistent developments of key features in such views. Ideal-typical theories of sport express alternative normative interpretations of sport. They highlight and clarify value tensions and stimulate critical discussion over its development.

The Relativist Theory. The first alternative does not really provide any substantially principled answer to whether a certain technology in sport is acceptable or not but needs to be discussed due to its impact in current elite sport. I call this the relativist theory. The relativist takes interest in the internal norms and values in sport only if and insofar these norms and values serve to realize goals external to sport. Sport relativism comes in many versions depending on what is seen to serve the maximum realization of these goals. Relativists can promote anything from entertainment hedonism including aggression, sexism, and violence to well-established sporting ideals such as courage, stamina, and perfectionism. Sport relativism is an expression of pure instrumentalism. [5]

Versions of the relativist theory can be found in the former ideologically driven East European sport systems in which elite sport was officially defined as a means to demonstrate the superiority of socialist over capitalist man (25), and in the modern world of elite sport expressed among others by most organizers of the Olympic Games who are driven by a quest for national, political and cultural acknowledgment (9). The relativist point of view is even more clearly present in the commercial sport entertainment industry in which viewer ratings and commercial potential seems to be the goal that justifies all means. [6]

In terms of technology, the implication of the relativist theory is that any efficient performance-enhancing means in terms of realizing prestige and/or profit is an acceptable means. This does not necessarily lead to controversy. For instance, in preparing for the Beijing Games Chinese sport authorities made great efforts in building up tight antidoping schemes and 'clean' performances. A positive Chinese doping test would have brought shame on the host nation. On the other hand, as Spitzer's (29) dramatic accounts of the DDR doping system demonstrates: if doping is an efficient hidden means in promoting international recognition relativist theories offer no reservations.

I shall not spend time criticizing the relativist point of view. Although it provides significant insights into the *Realpolitik* of elite sport, it contributes little to the question of possibilities of distinguishing in reasonable ways between nonacceptable, acceptable and valuable sport technologies.

The Narrow Theory. An alternative can be found in what can be called the narrow theory. In contradistinction to the relativist theory, the narrow theory includes a particular view of sport values. Sport's key value, as expressed in the Olympic slogan *citius, altius, fortius,* is performance and progress. Its paradigmatic expression is the sport record. Pierre de Coubertin, the founding father of the modern Olympic movement, referred to the record as having the same function in Olympic ideology as the law of gravity in Newtonian mechanics: the record is 'the eternal axiom' of elite sport (13). To the narrow theorist the key value of sport is linked to the exploration and transcendence of the limits of performance. Sport is considered to be about the maximization of human performance potential, and biotechnological innovations are seen to open new and valuable possibilities in this respect.

This view can be labeled the narrow theory since it relates relatively independently to the main moral or sociocultural value systems outside of sport itself. As in certain parts of Coubertin's writings, Olympic sport and the elite athlete was the ideal of the emerging modern society in which inherited privileges and wealth should no longer determine social status but individual talent and merit alone.[7] Olympic sport is to set the normative standard of society and not the other way round.

The narrow theory is politically incorrect and has few public defenders. Still, experiences from subcultures within athletics or professional cycling indicate that it has a certain impact among athletes and supporter systems (33). The theory is the sport version of a more general system of thought of technological optimism in which technology is seen as having the potential of radical human liberation (4: 8–10). Humanity is considered to enter a new and promising age in which traditional distinctions between the biological and the technological and the organic and the mechanical are transcended. Miah (19) has explored some of these ideas in his work on genetic technologies and sport. Tamburrini (30) provides a philosophical version of the narrow theory of sport with a no-regulation approach to both traditional performance-enhancing drugs and to genetic technologies.

The implications of the narrow theory for views on sport technology are quite radical. Within competitions there is a strong fairness requirement. The narrow theorist searches for reliable and valid evaluations of performance. Inequalities in technology may cause measuring errors. In terms of equipment, we might expect even more strict rules than today.

Outside of competitions, on the other hand, the narrow theorist accepts no sport-imposed regulations whatsoever. Ideas of 'the natural' and of biological limits are rejected as prejudices and irrational traditionalism. Rules against drugs are seen as unjustified paternalism. Athletes take informed choices and professional risks (30). They ought to develop performance with whatever means they find appropriate.

The narrow theory is clear and consistent. It challenges traditional sport views and seems close to the social logic of elite sport with its uncompromising quest for improvements. Moreover, the history of sport is in many ways a history of reducing control and restrictions on athletes and performance. Amateur rules that defined sport only for the higher socioeconomic classes and eligibility rules discriminating athletes based on sex and race are abandoned in favor of pure athletic meritocracy. To the narrow theorist, the ban on drugs is the last remains of an anachronistic sport understanding.

However, the narrow theory can be exposed to several objections. One criticism is that in real life, the theory seems naive. A core premise is the view of the empowered individual making free and informed choices. However, as are demonstrated by sociological analyses of the social context of doping, elite athletes are embedded in complex networks of power relations (Hanstad 2009). No athlete is an island with full freedom to choose. In early stages of their carrier in particular, young athletes depend more or less totally upon good advice and guidance from coaches and support systems. Moreover, the survival of support systems depends upon sport success. If efficient doping is legalized the social logic of the system implies a coercive effect on all athletes and support systems competing at the same level (21). There is reason to believe that control over and responsibility for performance will be moved even more than today from athletes toward exter-

nal expert systems. Athletes' status as free, informed and responsible moral agents is threatened. In worst case scenarios, sport might turn into something like grand experiments of human performance with athletes as the guinea pigs (9).

Are there alternative normative theories of sport with less controversial technological consequences?

The Wide Theory. A third alternative is a wide theory of sport. The key idea is that sport has meaning over and above mere performance. Sport is connected to deeper sociocultural andmoral values. As a social practice, sport has its own specific norms and values but is at the same time an integrated part of more extensive and general systems of human ideals.

The wide theory has many roots: classic ancient thinking about athletics, British amateur ideology, and Olympic ideology in its full version. Furthermore, wide theories are expressed in more critical and systematic ways in scholars such as Fraleigh (1984), Simon (1992), and Morgan (1994).

In Loland's (15) version, and inspired by Rawls' (1971) Aristotelian principle, competitive sport is interpreted based on a perfectionist ethics in which individuals are seen to flourish only and insofar as they realize their innate and trained abilities and skills to increased levels of complexity. If practiced in the right way, sport becomes part of a cultivation project where the development of performance is part of a general development of athletes as free and responsible moral agents. Sporting excellence is a particular expression of human excellence. The crucial point, according to Murray (22), is an understanding of performance as a virtuous development of talent. Only in this way sport can be a sphere of values and ideals in society.

What are the implications of the wide theory for performance-enhancing technologies? The perspective shares with the narrow theory the view of the significance of equality of opportunity to perform within competitions. Competitions have to be fair. Equipment ought to be standardized, or at least all competitors ought to be given equal access to the same kind of technology.

Moreover, developments and innovations in body techniques are seen as expressions of sport-specific human talent and creativity and are, generally speaking, admirable. Jan Boklöv and Dick Fosbury are heroes of their sports. Similarly, as long as the requirements on equal access and nonharm are met, innovations in sport equipment can enable further exploration of athletic talent and human excellence.

But this is not enough. In contradistinction to the narrow theory, the wide theory accepts regulations of biomedical means and methods. Athletes are to realize their potential as moral agents and this can only be achieved if they have insight in, control over and responsibility for their performance.

Consequently, wide theories are critical to performance-enhancing expert-administrated technology as it tends to reduce athlete effort and control over and insight in performance. Responsibility for performance is moved from the athlete toward external expert systems. Sport may lose its potential for cultivating athlete freedom and responsibility. Among wide theorists, there is skepticism toward harmless variants such as hypoxic tents and a call for a continuous critical discourse on their use (16). Although there are varying opinions among wide theorists about the justification and efficiency of the antidoping campaign, harmful

technologies such as doping seem to increase the vulnerability of athletes to exploitation and harm and are considered problematic in relation to sport values.[8]

As with its alternatives, the wide theory can be exposed to several lines of critique. One critical argument can be that wide theories are idealistic and lack connection to the harsh realities of current elite sport. For instance, reviews of sports broadcasting and the aggressive construction of elite sport in the mass media show little or no traces of wide theories.[9] On the other hand, the criticism is not necessarily on target. Inside studies of the social practice of elite sport cultures demonstrate a humility and seriousness that gives empirical support to the idea of sport as a sphere of perfectionism (26).

Another line of critique is that even if expert-administrated technologies and the associated health risks are problematic, a ban makes the situation even worse. The use of drugs becomes more dangerous if it goes underground. In a more liberal system, athletes who choose doping could at least get decent medical care and advice (12). But this is a problematic claim. As said above, the web of social networks in which athletes are embedded puts them in vulnerable positions. The athlete is contested terrain. The strong drive toward success in elite sport systems makes the legalization hypotheses of responsible and moderate doping use less probable.

To the wide theorist, therefore, antidoping is the lesser evil that to a larger extent protects the integrity of athletes as moral agents. A challenge is of course the difficulties of exact line drawing between valuable, acceptable, and nonacceptable technologies. However, wide theorists do not consider this a big problem. On the contrary, as Murray (22) notes, so-called 'gray zones' are actually signs of real moral terrain and underline the need for a continuous ethical discourse on performance-enhancing technology in sport.

Conclusion

I started with a conceptualization and a tentative categorization of sport technology. I proceeded with looking at the use of performance-enhancing technologies, and I have demonstrated how technology policies necessarily are linked to more or less clearly articulated normative theories of sport. I have sketched three such theories—the relativist theory, the narrow theory, and the wide theory—and examined critically their implications for technology.

There should be no doubt about my preference here. I find the wide theory in one version or the other the most promising one. However, some versions of the narrow theory have merits and may very well become hegemonic in the time to come. Why should we be skeptical to performance-enhancing technologies if they can enhance the quality of life for people both inside and outside of sport? Narrow theories challenge our preconceptions and attitudes in direct and relevant ways.

Still, critical reflection upon the use of technology in sport can never be reduced to a question of progress and records alone. The key challenge for the narrow theorist is a philosophically sound response to the question of why all kinds of expert-administrated performance-enhancing technologies are of value to

sport. In terms of explanatory power, this is where, I believe, wide theories still have the upper hand.

Notes

1. Thanks are due to John Russell and Miller Brown for helpful comments to a previous draft of this article.

2. This essay is a development of my article 'Technology in Sport: Three Ideal-typical Views and Their Implications', published in *European Journal of Sport Science* 2 (1), 2001, 1–10.

3. http://en.wikipedia.org/wiki/Technology. Accessed May 15th, 2009.

4. http://www.wada-ama.org/rtecontent/document/code_v3.pdf, p. 3. Accessed May 15th, 2009.

5. For a discussion of how even pure relativist and instrumentalist views of sport necessarily must considerations of sport's internal values, see Russell's discussion in (27).

6. For analyses of the commercial driving forces in entertainment sport, see part II of (23).

7. Even if Coubertin in some of his writings was an exponent for unlimited progress and human transcendence, other writings express more traditionalist views of the need for moderation. For an analysis of Coubertin and his writings, see (17)

8. For instance, Miller Brown offers careful analyses of the ban on drugs as a case of unjustified paternalism (2,3), whereas Murray (22) draws the different conclusion and justifies the ban as the lesser evil to protect 'the virtuous development of natural talents'.

9. For analyses and discussions, see part IV in (23).

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